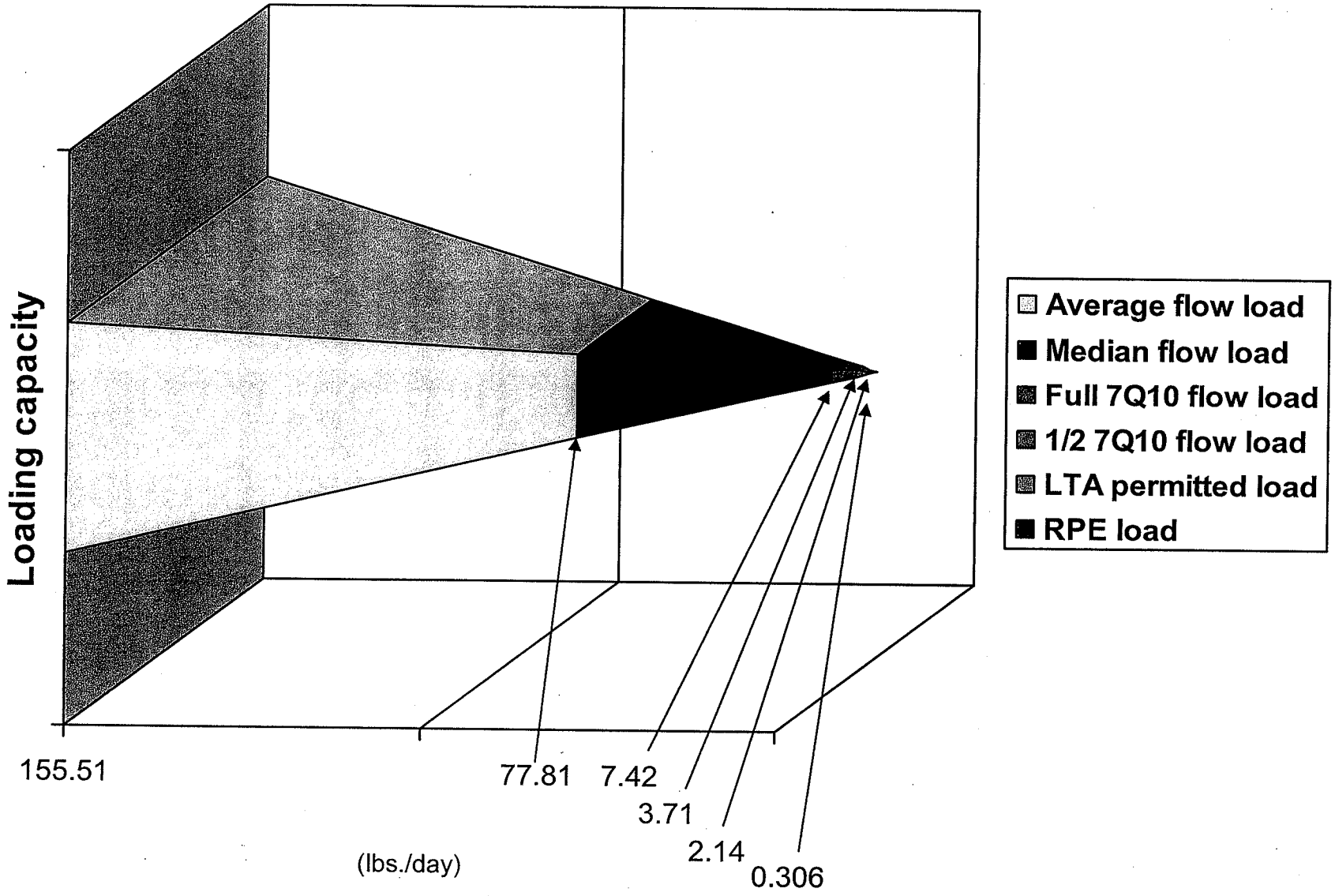
Simplified View of Loading Capacity Use in NPDES Permit Limits

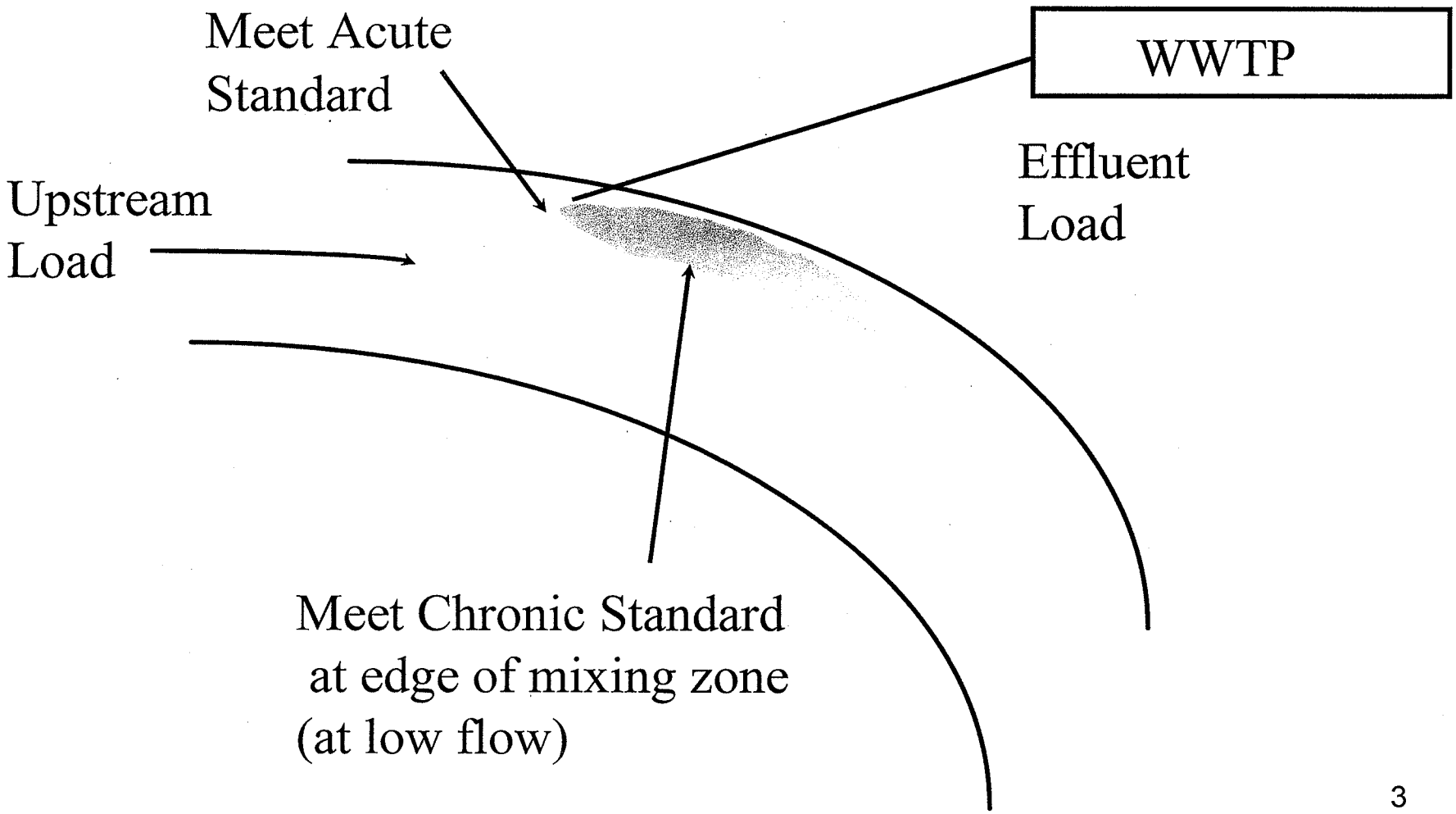


Flow based on USGS "Low-Flow Characteristics of Indiana Streams" White River at Indianapolis. Assumes a 0.02 mg/L chronic standard

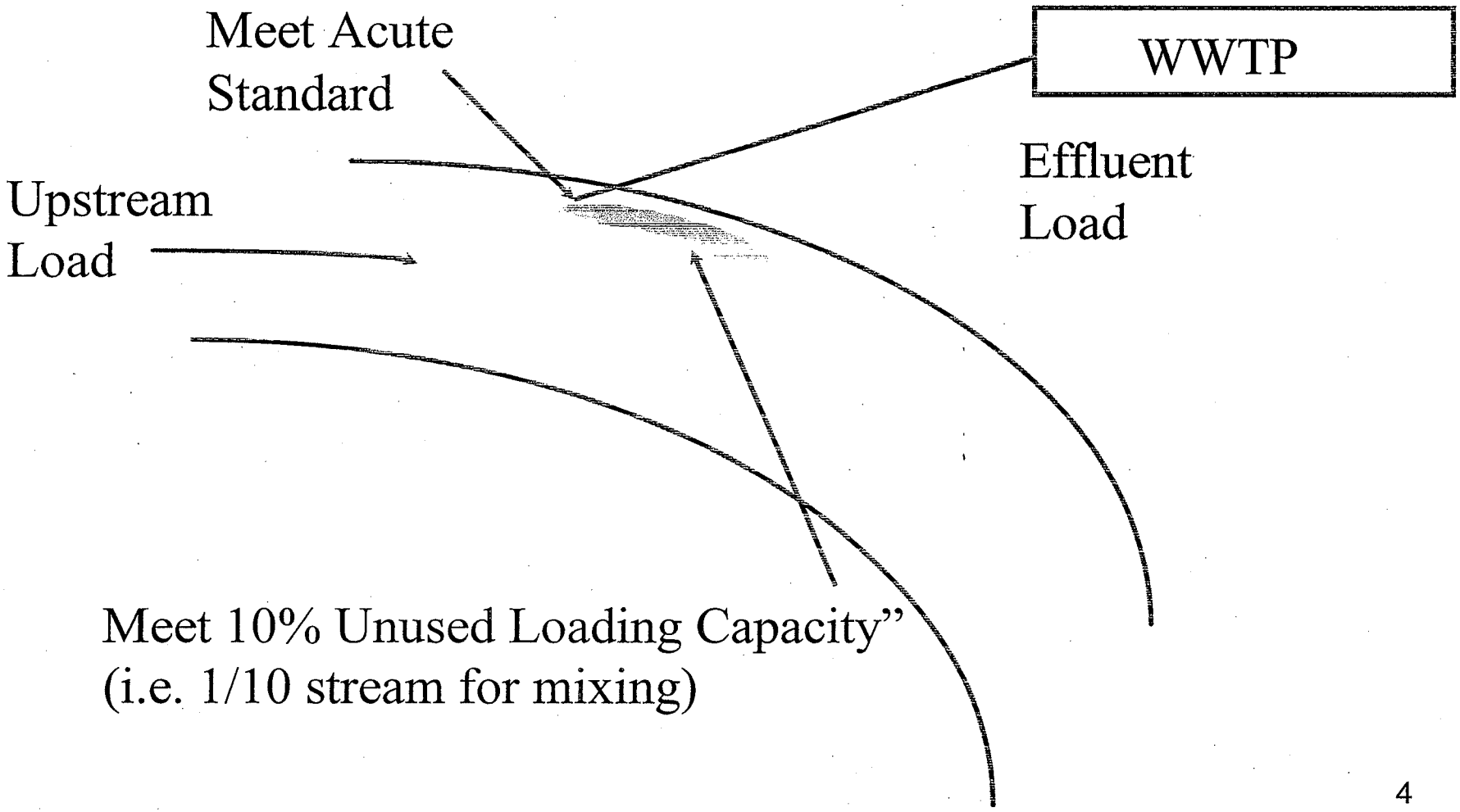
Understanding a “de minimis” discharge

- All designated uses will be maintained
- NPDES permitted processes control discharges with conservative assumptions
- Setting a “de minimis” discharge threshold below existing NPDES permitting needs to be based on an explainable and rationale approach

Permit Limit Setting Process without Antidegradation Considerations



Existing "De Minimis" Lowering of Water Quality for High Quality Waters



Example White River at Indianapolis

Stream design flow
Seven consecutive day low flow (7Q10) = 44.5 Million Gallons per Day (MGD) (69 cfs)
Median flow = 466.5 MGD (723 cfs)
Average flow = 932.5 MGD (1,445 cfs)

>99% of time flow is greater than 7Q10
Less than 1% chance that 7Q10 flow is present in stream on a daily basis

Mixing zone
Allowable 7Q10 flow for mixing = 22.3 MGD (34.5 cfs)
>99.5% of time flow is above this value (7Q50 = 47 cfs; <1% chance in 50 years; 1 in 18,250 days)

Facility flow used in permitting
Highest monthly average over the last 36 months = 1 in 36 chance
(2.8% chance discharge flow could be greater)

NPDES Permit Limit Setting Factors

Reasonable Potential to Exceed (RPE)

Default Multiplier = 6.2 (i.e. statistical safety factor to which leads to getting 16.1% WQBEL being allowed – see 327 IAC 5-2-11.5)

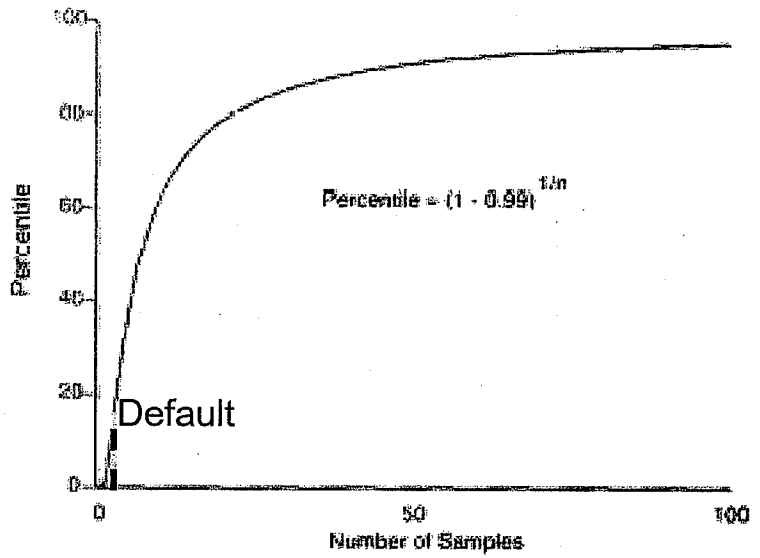
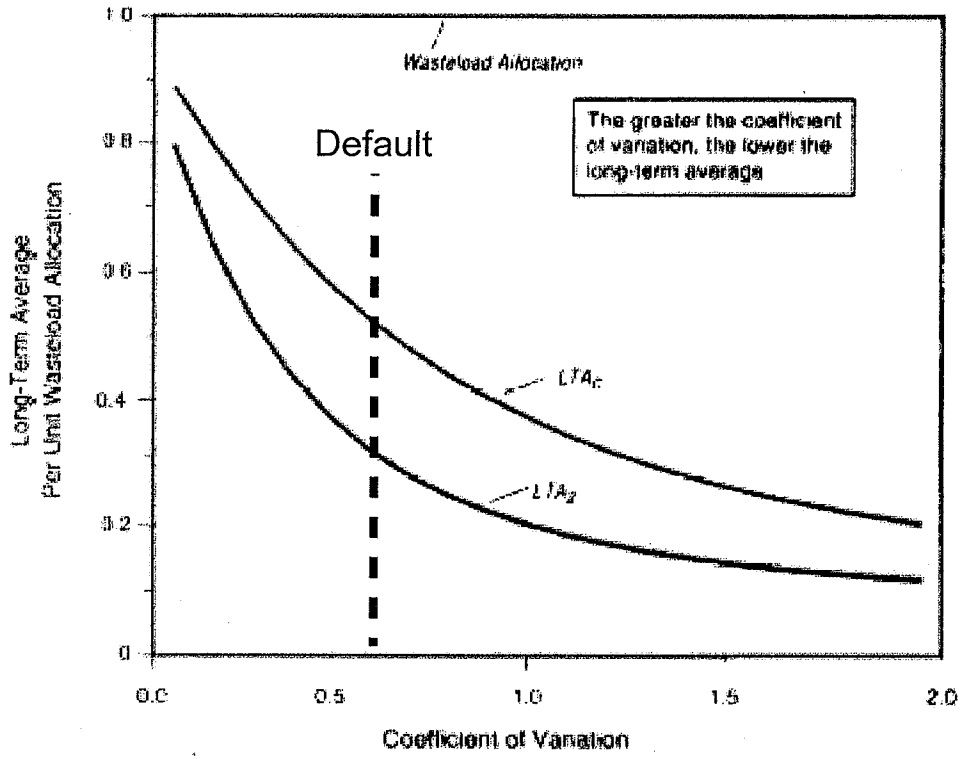


Figure 3-1c. Relationship Between the Largest Value of n Samples and the Percentile It Exceeds with 99 Percent Confidence

NPDES Permit Limit Setting Factors

Long Term Average

30 day monthly average permit limit is 36% less than actual unused loading capacity (See 327 IAC 5-2-11.6)



Review of the conservative factors used to set WQBEL NPDES permit limits

	Probability
Stream flow (frequency of 7Q10 occurrence)	<0.01
Facility flow (frequency of high flow occurrence)	0.03
Long Term Averaging (monthly average limits are 70% of wasteload allocations)	0.64
RPE (allows on 16% average limit)	0.16
Cumulative Events	0.000031

1 in 32,552 chance of a WQBEL being exceeded on a daily basis using existing calculations

Conclusions

- Existing NPDES WQBEL methods assure a high degree of protection
- Use of unused assimilative capacity for an antidegradation threshold can be rationally justified
- Need for new or increased permit limit should be first issue to trigger looking at a de minimis (i.e. RPE should be threshold for limit based on water quality)